Applications for maritime services: safety and security in vessel traffic

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Maritime safety and security/DeMARINE

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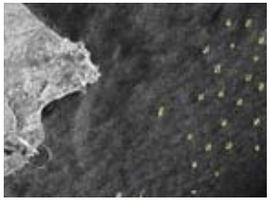
Bremen Innovativ



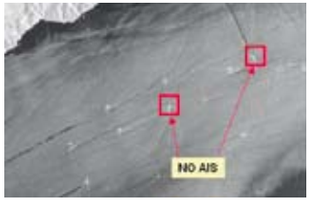
› Vessel fleet detected in X-SAR data

› Up to 10,000 containers are lost annually due to extreme rolling

What is the aim of DeMARINE?

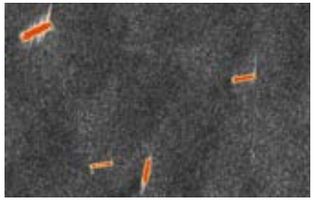
DeMARINE, DeCOVER and DeSECURE are German, DLR funded gateway projects to the European GMES programme. The three projects will pave the way for the first GMES services with a special focus on the needs of the German user community. The motivation to start DeMARINE is to show potential fields of application for the planned GMES marine core services concerning safety and security in coastal and sea traffic as well as coastal protection. DeMARINE is divided into DeMARINE Environment and the collaborative project DeMARINE Safety and Security presented here.

The first applications are in the fields of ship detection (or detection of other man-made objects) and improving the forecasting of critical sea conditions, particularly with regard to parametric rolling. In these fields of application the high resolution German satellite system TerraSAR-X is used. The three-year-project is funded by the Federal Ministry of Education and Researchand supervised by the German Aerospace Centre (DLR) under the project number 50 EE 0812.

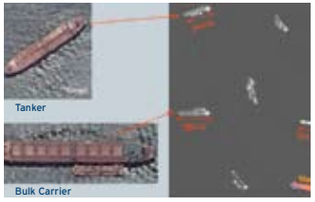


› Ship detection by assimilation of Earth Observation and Automatic Identification System (AIS) data

› Wakes induced by ships can be detected from space



› The dimension of detected ships can be estimated in high resolution SAR data



› Detection of man-made objects

The projects

ShipDetec, Parol and DEKO are three subprojects of DeMARINE:

ShipDetec: Maritime Surveillance
ShipDetec is a R&D project in the field of maritime surveillance integrating the Earth Observation (EO) data from radar satellites (TerraSAR-X) with Automatic Identification System (AIS) data over the same geographical area. The main focus is on the development of SAR processing algorithms specifically tailored to detect ships and the integration of this EO data with AIS data, validated in representative test scenarios. Project partners are OHB (Lead), DLR Institute IMF and GAUSS

DEKO: Detection of man-made objects
The first aim of this project is to combine optical remote sensing data and TerraSAR-X data to improve detection of objects in the maritime environment. Other goals are the interferometric detection of moving objects and the development of feature based detection methods for polarimetric data. Project Partners are Astrium (Lead), Infoterra and Fraunhofer IITB

Parol: Parametric Rolling
It is estimated that cargo ships lose up to 10,000 containers each year due to extreme rolling. This project aims to improve maritime safety within civil shipping, in particular by reducing the risk faced by ships regarding parametric rolling. The goal of the project is to derive the sea state from model data supported by satellite-based measurements and to analyse if dangerous conditions might occur for the ship travelling in the area concerned. A critical combination of sea state and direction of travel could result in the loss of cargo or the entire ship.

Project partners are DLR institute IMF (Lead), OHB, GAUSS, German Weather Service (DWD), German Federal Waterways Engineering and Research Institute (BAW) and GAUSS.

Further Information under www.demarine.de